REMARKS

Claims 1, 3-10, 13-15, 17, 19-20, 22, 24, 25, and 40-59 are pending in this application. Claims 42-45 remain withdrawn from consideration. By this Amendment, claims 26 and 28 are canceled.

Applicants appreciate the courtesies shown to Applicants' representative by Examiner Gray in the August 25 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

I. INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement with Form PTO-1449 was filed with the application on August 10, 2001. Applicants have not yet received back from the Examiner a copy of the Form PTO-1449 initialed to acknowledge the fact that the Examiner has considered the cited information. The Examiner is requested to initial and return to the undersigned a copy of the subject Form PTO-1449. For the convenience of the Examiner, a copy of that form is attached.

II. §102 REJECTIONS

Claims 26, 28, 40 and 41 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,465,728 to Haigh, deceased, et al. (U.S. 728) and U.S. Patent No. 4,059,471 to Haigh (U.S. 471) (collectively Haigh) and as being anticipated by U.S. Patent No. 5,308,426 to Claveau (Claveau). Applicants respectfully traverse the rejections.

Claims 26 and 28 are canceled, thus rendering the rejection of these claims moot. Claims 40 and 41 are directed to a molded resin article wherein its surface layer is modified with a florescent dyestuff (claim 40) or a photochromic dyestuff (claim 41) having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart a florescent light-emitting function (claim 40) or a photochromic function (claim 41) to the surface layer.

Neither Haigh nor Claveau teach the claimed molded resin article wherein its surface layer is modified with a florescent dyestuff or with a photochromic dyestuff.

Applicants disclose that in addition to standard coloring dyes, the claimed invention may incorporate modifications imparting functions such as florescence, phosphorescence, photochromism, photorefractive effects, physiological functions, and/or medicinal functions to the surface of the molded resin article. See the specification at page 32, lines 6-14. Claims 40 and 41 are respectively directed to a molded resin article wherein its surface layer is modified with the florescent dyestuff and photochromatic dyestuff, respectively, which impart fluorescent and photochromic functions to the claimed articles.

In contrast to the claimed invention, Haigh describes dye absorption onto the surface of plastics using a dye transfer paper, pressure, and heat. Haigh further describes an "in-mold" dye decoration method wherein the plastic resin material is concurrently dyed and molded to form a molded article. See the Abstract. Haigh generally discloses that "the dyes can be of various dyes (including dispersed dyes) capable of sublimation at 200°F and up, including those dyes in use on heat transfer papers for dye transfer in the textile industry." See U.S. 471 at col. 3, lines 29-32 and U.S. 728 at col. 3, lines 41-44. In fact, Haigh only generally disclosed that "the dyes can be of various dyes," an is silent regarding any florescent function or photochromatic function.

Furthermore, in contrast to the claimed invention, Claveau is directed to a process for decoration by sublimation of an ink. See the Abstract. Claveau attempts to overcome irregularities that result from paper sheet creases or crumples when the paper is positioned in a vacuum around an object to be decorated. See col. 1, lines 22-24. However, Claveau does not teach a molded resin article wherein its surface is modified with a florescent dyestuff or a photochromatic dyestuff. In fact, Claveau only generally discloses sublimating ink over an object, and is silent regarding any florescent function or photochromatic function.

For at least these reasons, Haigh and Claveau fail to teach every feature of claims 40 and 41. Accordingly, claims 40 and 41 are not anticipated by Haigh or Claveau. Reconsideration and withdrawal of the rejection are respectfully requested.

III. §103 REJECTIONS

The Office Action rejects claims 1, 3-10, 13-15, 17, 19, 20, 22, 24, 25 and 46-59 under 35 U.S.C. §103(a) as being unpatentable over Claveau. Applicants respectfully traverse the rejection.

Claim 1 recites: "a modification method of the surface layer of a molded resin article comprising bringing the clothed space to a saturation sublimation pressure state of the organic compound." Method claims 3-10, 13-15 and 46-59 depend from claim 1 and include all of its features. Claim 17 recites: "a modification apparatus for the surface layer of a resin comprising a tightly closable container...and the molded resin article in a saturated sublimation pressure state of the organic compound." Apparatus claims 19, 20, 22, 24 and 25 depend from claim 17 and include all of its features. Claveau does not teach or suggest a method step of bringing the clothed space to a saturation sublimation pressure state of the organic compound, of claim 1 or the apparatus structural feature a tightly closable container...and the molded resin article in a saturated sublimation pressure state of the organic compound of claim 17.

In the specification, Applicants disclose that a "saturated sublimation pressure" is defined as a vapor pressure in a certain constant temperature of a thermodynamic system, in which a substance vapor pressure is in an equilibrium state on the surface of a substance. Applicants further disclose that the saturated vapor pressure does not depend on a substance amount, it depends only on temperature, and monotonously increases with a temperature rise. See the specification at page 8, line 21 to page 9, line 6. Thus, Applicants disclose the unexpected advantage provided by the claimed saturated sublimation pressure state, and the

advantages of a vapor pressure in an equilibrium state versus in a vapor pressure in a non-equilibrium state.

In contrast to the claimed invention, traditional sublimation methods are conducted under non-equilibrium conditions. For example, Applicants disclose that in a traditional vapor deposition method, the temperature of the vapor deposition source is set to be higher than the temperature of a substrate subjected to film formation, and the vapor of the organic compound that flies from the vapor deposition source is deposited on the surface of the substrate subjected to film formation with a lower temperature. Applicants have discovered that under non-equilibrium conditions, the film thickness can be controlled only by mechanical means, and a uniform thickness is not easy to obtain. See the specification at page 4, line 19 to page 5, line 7.

Applicants further disclose that in other known sublimation dye transfer methods, the dye/ink formed into the film on the surface of a transfer ribbon or sheet is heated with a heating head, sublimated and deposited or allowed to penetrate into a transfer layer of a sheet surface. However, Applicants have discovered that this traditional sublimation dye transfer method is unsuitable for coloring the resin surface of a large area with a uniform density, and it is unsuitable for coloring a molded resin article having a complicated surface shape. See the specification at page 5, line 8-19.

As discussed above, Claveau discloses a process for the decoration of the surfaces of an object by sublimation of ink in an effort to overcome irregularities due to paper sheet creases or crumples resulting when the sheet is positioned in a vacuum around the object to be decorated. See the Abstract in col. 1, lines 22-24. However, Claveau is silent regarding the vapor pressure and any equilibrium/non-equilibrium conditions in the disclosed method. Furthermore, Claveau is silent regarding the differences between a substance vapor pressure

is in an equilibrium state and a non-equilibrium state, and fails to teach the unexpected benefits of the claimed saturation sublimation pressure state.

For at least these reasons, Claveau fails to teach or suggest every feature of claims 1 and 17. Accordingly, claims 1 and 17 are patentable over Claveau. Dependent claims 3-10, 13-15, 19, 20, 22, 24, 25 and 46-59 depend from claims 1 and 17, and thus include all of their features. Accordingly, these dependent claims are patentable over Claveau for at least the same reasons as claims 1 and 17. Reconsideration and withdrawal of the rejection are respectfully requested.

IV. CONCLUSION

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 3-10, 13-15, 17, 19, 20, 22, 24, 25 and 40-59 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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JAO:PAC/tea

Attachment:
Copy of August 10, 2001 Form PTO-1449

Date: September 3, 2004

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